Rio Grande Leopard Frog *Rana berlandieri*

Ecology: The Rio Grande leopard frog (*R. berlandieri*) is nocturnal and highly aquatic. Rio Grande leopard frogs are typically found on the edges of large slow-moving rivers, in agricultural ditches, drains, canals, and sumps (Platz et al. 1990; Jennings and Hayes 1994; Rorabaugh et al. 2002). *R. berlandieri* are pale green, olive, or a grayish brown with dorsal spots that are dark with a light rim, and dark reticulations on their thighs. *R. Berlandieri* also has prominent dorsolateral folds that turn inward in front of the groin. A light stripe also runs along the jaw but fades or completely disappears in front of the eye. Adults are 2.25 to 4.25 inches long from snout to vent (Hillis et al. 1983; Behler and King 1992; Stebbins 2003).

Hillis (1981) found that in central Texas *R. berlandieri* typically breeds in pools along flowing streams or rivers; though breeding can also occur in artificial ponds and tanks. In warm climates, the species may breed year around (Garrett and Barker 1987; Davidson 1996). In central Texas, the species breeds in spring and fall, but in areas of sympatry with other leopard frog species breeding occurs in fall and early winter (Hillis 1981; Platz 1972).

R. berlandieri feed on a variety of insects and invertebrates. In Texas, frog stomachs often contained small leopard frogs (Platz et al. 1990).

Distribution: *R. berlandieri* occur from central and western Texas and the Pecos River drainage in Eddy County, southeastern New Mexico, south along the Atlantic slope through at least southeastern Mexico (Platz 1991; Degenhardt et al. 1996; Conant and Collins 1998; Dixon 2000). *R. berlandieri* is not currently found in Utah. However, populations have been identified in the Lake Powell region in Arizona (Rorabaugh 2008) and pose an immediate risk of spread throughout Lake Powell.

Pathways of Introduction: *R. berlandieri* may arrive in Utah as an aquatic "hitchhiker" on boats launching at lakes within the state. There is a distinct possibility that migration from Arizona will occur, if it has not already. Introductions into the Lake Powell region were likely a result of anglers from Arizona using this species as bait or possibly through aquarium releases (Wilson 2008).

Management considerations: Management of frog populations is difficult because of their juxtaposition to native species in shared aquatic habitats. Current control efforts range from removal of breeding adults to removal of all life stages. Adult frogs can be removed by trapping or hand captures. However, most mechanical methods are only successful in small areas, with limited populations (Pitt and Witmer 2006). Tadpoles can be destroyed by draining ponds or chemical treatment (Pitt and Sin 2004). Fencing may also be used to reduce spread of frogs from infested habitats (Pitt and Witmer 2006). The efficacy of previous efforts, as it relates to reduction in population growth or cost-effectiveness, has not been well evaluated (Govindarajulu et al. 2005).

Literature Cited:

Behler, J. L., and F. W. King. 1992. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York.

Conant, R. and J.T. Collins. 1998. A field guide to amphibians and reptiles: Eastern and Central North America. Third edition, expanded. Houghton Mifflin Company, Boston.

Davidson, C. 1996. Frog and toad calls of the Rocky Mountains. Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, New York.

Degenhardt, W.G., C.W. Painter and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque.

Dixon, J.R. 2000. Amphibians and reptiles of Texas: with keys, taxonomic synopses, bibliography, and distribution maps. W.L. Moody Jr. editor, Natural History Series, Number 25, Texas A&M University Press, College Station, Texas.

Garrett, J.M. and D.A. Barker. 1987. Field guide to reptiles and amphibians of Texas. Texas monthly field guide series, Gulf Publishing Company, Houston.

Govindarajulu, P., R. Altwegg, and B. R. Anholt. 2005. Matrix model investigation of invasive species control: bullfrogs on Vancouver Island. Ecological Applications 15(6):2161-2170.

Hillis, D.M. 1981. Premating isolating mechanisms among three species of the *Rana pipiens* complex in Texas and southern Oklahoma. Copeia 1981:312–319.

Hillis, D.M., J.S. Fros and D.A. Wright. 1983. Phylogeny and biogeography of the *Rana pipiens* complex: A biochemical evaluation. Systematic Zoology 32:132-143.

Jennings, M.R. and M.P. Hayes. 1994. Decline of native ranid frogs in the desert southwest. Pages 183-211. *In* P.R. Brown and J.W. Wright editors. Herpetology of the North American Deserts, Special Publication, Number 5, Southwestern Herpetologists Society, Van Nuys, California.

Platz, J.E. 1972. Sympatric interaction between two forms of leopard frog (*Rana pipiens* complex) in Texas. Copeia 1972:232–240.

Platz, J.E., R.W. Clarkson, J.C. Rorabaugh and D.M. Hillis. 1990. *Rana berlandieri*: recently introduced populations in Arizona and southeastern California. Copeia 1990:324–333.

Platz, J.E. 1991. Rana berlandieri. Catalogue of American amphibians and reptiles: 508.1-508.4.

Pitt, W. C., and G. W. Witmer. 2006. Invasive predators: a synthesis of the past, present, and future. Wildlife Damage Management, Internet Center for USDA National Wildlife Research Center – Staff Publications. University of Nebraska, Lincoln.

Pitt, W. C. and H. Sin. 2004. Dermal toxicity of citric ascid based pesticides to introduced Eleutherodactylus frogs in Hawaii. USDA, APHIS, WS, NWRC. Hilo, Hawaii.

Rorabaugh, J.C., M.J. Sredl, V. Miera and C.A. Drost. 2002. Continued invasion of an introduced frog (*Rana berlandieri*): southwestern Arizona, southeastern California, and Rio Colorado, Mexico. Southwestern Naturalist 47:12–20.

Rorabaugh, J. C. 2008. Personal communication. United States Fish and Wildlife Service. Phoenix, Arizona.

Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. 3rd Edition. Houghton Mifflin Company, New York.

Wilson K. 2008. Personal communication. Utah Division of Wildlife Resources, Native Species Coordinator. Salt Lake City, Utah

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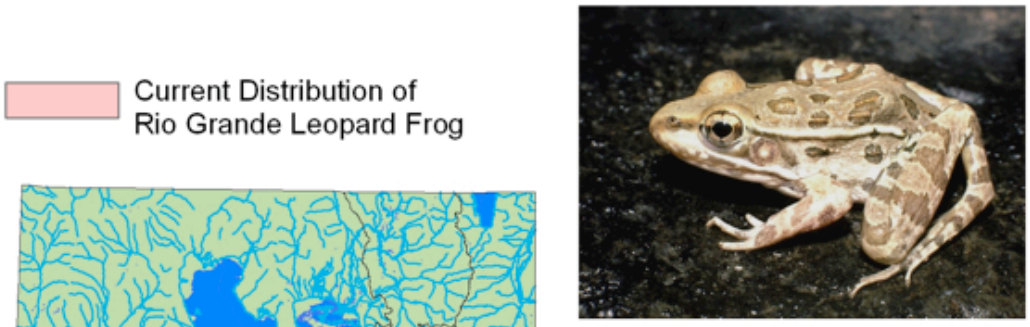

Photo by Jim Rorabaugh